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- ACTIVITY, *Anolis nitens tandai* (diel cycle) 401–412; *Rana muscosa* (yrly. activ. cycle rel. to mvmnts. btwn. habs.) 787–793; *Clinocottus analis*, *Girella nigricans* (diel chngs. in hab. use in tidepools rel. to temper. & pred. avoid.) 835–841.
- AGE, *Plethodon kentucki* (rel. to growth & surv.) 108–117; *Anolis nebulosus* (aff. perch height) 187–193; *Careta caretta* (skeletochron. valid. in wild adult) 240–242; *Crotalus enyo* (chng. in prey types with age) 553–555; *Niveoscincus ocellatus* (geogr. var. in hab. temp. aff. age & size at matur.) 646–655; *Torpedo californica* (longev., age & size at sex. matur., popn. age struct.) 842–847.
- BEHAVIOR, *Thamnophis sirtalis parietalis* (mvmnts. & mating at spring den dispersal, sex. dimorph.) 82–91; *Alytes obstetricans* (female mate choice rel. to call timing in male duets) 169–177; *Podarcis (melisellensis, muralis)* (thermoreg. in autumn) 178–186; *Anolis nebulosus* (gender, age, reprod. seas., temper. & wet & dry seas. aff. perch height) 187–193; *Platymantis browni* n. sp. (descript., sonograms of calls, calling circumstances) 194–202; *Crotalus viridis concolor* (preg. female mvmnts.) 229–234; *Gekko gecko* (advertisement calls, rel. to light, temp. & reprod. seas.) 248–253; *Etheostoma (zonale, olmstedi)*, *Percina peltata* (aggress. displicmmt. of native sp. by introd. congener) 254–261; *Bitis arietans* (mechanics of defensive hissing in snake) 270–273; *Xiphophorus pygmaeus* (female pref. for lg. males absent, gene base for male size polymorph. diff. in other *Xiphophorus* spp.) 355–364; *Thamnophis sirtalis* (abnormal thermoreg. in captive gravid females lowers offspring viability) 365–371; *Anolis nitens tandai* (thermoreg.) 401–412; *Anolis carolinensis* (evid. of taste in prey discrim.) 490–498; *Auchenoglanis occidentalis* (nesting & brooding beh., male parental care) 566–570; *Negaprion brevirostris* (natal homing, biennial reprod. cycle, microsat. DNA evid. of multi. patern. of litter) 781–786; *Careta caretta* (nesting depth & loc. aff. dipteran larval infest. of eggs) 808–812; *Lucania goodei* (male breeding beh.) 823–828; *Cynoscion regalis*, *Ophidion marginatum* (captive *O. marginatum* "chatters" like field recordings of "chatters" attrib. to *C. regalis*) 854–859; *Physalaemus enesefae* (descript., oscillogram, sonogram, compare to congeners, indiv. var., correl. w/ body mass) 1064–1072; *Pelodytes ibericus* (response of calling males to recordings of male calls) 1142–1150.
- BIOGEOGRAPHY, *Eurycea bislineata* spp. complex (*wilderae, cirrigera*) (genet. evid. for valid. of spp. at contact zone) 25–34; *Dermophis* (7 spp.), *Gymnopis* (2 spp.), *Oscaecilia* (3 spp.), *Caecilia* (4 spp.) (based on new geol. info.) 52–64; *Phoxinus saylori* n. sp. (hypoth.) 118–128; *Platymantis browni* n. sp. (rel. to geol. of Bismarck Arch. & distrib. of all New Ireland frogs) 194–202; New World Beloniidae (13 spp.) (w/phyl. anal., info. on evol. of marine to freshwater hab. shifts) 324–338; *Cyclopus (elongatus, meridionalis, sp.)* (3 allotrop. ESUs, electrophor. data, units in diff. river drainages) 899–906; *Sanzinia madagascariensis*, *Acrantophis madagascariensis*, *Boa constrictor* (biogeogr. hypoth. for close rel. btwn. Madagascar & S. Amer. boids) 1151–1154.
- BLOOD, *Phrynosoma (cornutum)* [squirts blood], 5 of 7 spp. not prev. reported to squirt blood) (blood-squirting beh. var. in *P. cornutum*, blood squirting absent in 3 spp.) 1114–1122.
- CALLS, *Alytes obstetricans* (female mate choice rel. to call timing in male duets) 169–177; *Platymantis browni* n. sp. (sonograms compar. to sympatric congeners, calling microhab.) 194–202; *Proceratophrys bigibbosa* sp. group (*browni* n. sp., *bigibbosa*) (descript., sonograms) 203–215; *Gekko gecko* (sonograms of advert. calls, aff. by temp. & light, seas. var. rel. to reprod.) 248–253; *Cynoscion regalis*, *Ophidion marginatum* (captive *O. marginatum* "chatters" like field recordings of "chatters" attrib. to *C. regalis*) 854–859; *Physalaemus enesefae* (descript., oscillogram, sonogram, compare to congeners, indiv. var., correl. w/ body mass) 1064–1072; *Pelodytes ibericus* (response of calling males to recordings of male calls) 1142–1150.
- CANNIBALISM, *Eleutherodactylus cooki* (most egg mortal. due to cannib. in cave frog) 542–547.
- CHROMOSOMES, *Novumbra hubbsi* (kar., 2n = 48, NOR sites, C-banding, links sp. to *Dallia pectoralis*) 860–865; *Serrasalmus rhombeus* (2 karyotypes evid. for cryptic spp.) 866–869; *Cyclopus (elongatus, meridionalis, sp.)* (tetraploids, much dupl. gene expression, electrophor. data) 899–906.
- CIRCANNUAL RHYTHMS, *Cyprinodon diabolis* (in popn. size correl. w/ seas. of hab. water level) 224–228; *Rana muscosa* (mvmnts. btwn. habs. rel. to yrly. activ. cycle) 787–793; *Python curtus* (female reprod. cycle starts but not complete unless male present) 1138–1141.
- COLORATION, *Phoxinus saylori* n. sp. (distinct. from all congeners) 118–128; *Gerres silaceus* n. sp. (fresh & preserv.) 164–168; *Proceratophrys bigibbosa* sp. group (*browni* n. sp., *avelinoi*, *bigibbosa*) (in life) 203–215; *Bufo chavin* n. sp. (living & preserv.) 216–223; *Barbus amphigramma* & *Barbus taitensis* = *Barbus paludinosus* (color varies w/ wa-

ter clarity) 243–247; *Apogon (erythrinus, marquesensis* n. sp., *indicus* n. sp., *susanae*) (preserved & live) 459–472; *Bedotia masoala* n. sp. (disting. n. sp.) 482–489; *Apostolepis (brevicpis* n. sp., *vittata*) (disting. n. sp.) 501–507; *Bolitoglossa anthracina* n. sp. (live & preserved, diel var.) 700–704; *Otopharynx pachycheilus* n. sp. (living & preserved) 705–717; *Cnemidophorus (gularis septemvittatus, g. scalaris)* (Chihuahuan popns. assigned to subspp. by color. & scutation) 747–765; *Lucania goodei* (male anal fin color polymorph.) 823–828; *Gerres (longirostris, oblongus)* (in life & preserved) 954–965; *Lycodes pallidus* spp. complex (*paamiuti* n. sp. & 4 other spp.) 972–996; *Aspidoras taurus* n. sp. (preserved) 1010–1016; *Gerres phaiusa* n. sp. (in life, preserved) 1043–1049; *Moenkhausia (diktyota* n. sp., *oligolepis, sanctafilomenae, pyrophthalma*) (in life & preserved for n. sp., similar in all these spp.) 1058–1063; *Chromogobius (brotii* n. sp., *zebratus, quadrihvittatus*) (in life, disting. spp.) 1073–1080; *Poecilopsetta dorsalis* n. sp. (preserved) 1081–1086; *Polydactylus longipes* n. sp. (in life & preserved) 1087–1092.

COMPETITION, *Alytes obstetricans* (female mate choice rel. to call timing in male duets) 169–177; *Etheostoma (zonale, olmstedi)*, *Percina peltata* (compet. exclusion by aggress., introd. sp. vs native congener) 254–261; *Ascaphus truei* (compet. btwn. tdples. & insect herbivores) 422–429; *Lucania goodei* (male-male aggress. in breeding beh.) 823–828; *Bufo marinus* (forelimb robustness aids breeding males, evid. for sex. select. due to male-male comp.) 928–935; *Ambystoma (opacum, talpoideum)* (juv. response to marked substrates & presence of other juvs. in enclosure, no evid. of interspp. comp.) 1017–1025; *Physalaemus enesiae* (male-male comp. eff. on calling) 1064–1072; *Pelodytes ibericus* (response of calling males to recordings of male calls) 1142–1150.

CONSERVATION, *Rana sponcephala* (diff. in gen. var. in response to environ. stressor, conserv. implics.) 7–13; *Phoxinus saylori* n. sp. (very limited distrib., endngrd. in TN, cons. reccoms.) 118–128; *Cyprinodon diabolis* (popn. depends on maint. hab. water level) 224–228; *Etheostoma (zonale, olmstedi)*, *Percina peltata* (impls. of interbasin transfer of congeners) 254–261; *Rana (onca, yavapaiensis)* (phyl. anal. shows *R. onca* valid, genet. evid., ESU design. conserv. reccoms.) 339–354; *Gila (cypha, robusta)* (shape anal. w/ geom. morphomets. aids spp. ident. for conserv. mngrmnt.) 389–400; *Nottropis topeka* (stream & watershed charcs. rel. to decline of endngrd. sp., mngrmnt. implics.) 413–421; *Crotalus (willardi obscurus, w. willardi)* (conserv. reccoms. rel. to reprod. info.) 473–481; *Bedotia masoala* n. sp. (primary rainforest park includes part of range) 482–489; *Elassoma (boehlkei, okatie)* (ESUs in each river system, found in many Carolina fishes) 514–520; *Moxostoma robustum* (ESU in each river system, conserv. implics.) 526–530; *Hybognathus placitus* (sex. dimorph. in body shape useful in conserv. mngrmnt.) 563–565; *Rana muscosa* (high elev. declining frog, mnmts. btwn. habs. rel. to environ. variables & yrly. activ.

cycle, conserv. reccoms.) 787–793; *Kinosternon baurii* (conflict btwn. conserv. mngrmnt. technique for *K. baurii* & endngrd. deer) 797–801; *Lepidomeda vittata* (low genet. divers., 3 disjunct popns., conserv. reccoms.) 813–819; *Cycloleptus (elongatus, meridionalis)* sp. (3 allopat. ESUs, electrophor. data, more genet. info. needed for conserv. mngrmnt.) 899–906; *Etheostoma (rubrum, lyncium, whipplei)*, *Noturus hildebrandi*, *Cyprinella camura* (downstream alterations aff. distant upstream habs., popn. responses) 916–927; *Rana muscosa* (declining popns. rel. to high infect. rates w/ chytrid fungus, conserv. reccoms.) 945–953; *Batrachuperus* (the 5 spp. in China) (mtDNA data on lineages, conserv. reccoms.) 1100–1107; *Hyla regilla* (introd. pred. fish reduce frog popns., conserv. reccoms.) 1130–1137.

DENTITION, Teleost fishes (devel. of replcmnt. teeth, charc. distrib., evol. of derived state) 35–51; *Gasterosteus aculeatus* (# & pttn. of teeth:sex. dimorph., trophic diff. & Atlantic vs. Pacific Basin diff.) 936–944.

DEVELOPMENT, Teleost fishes (devel. of replcmnt. teeth, charc. distrib., evol. of derived state) 35–51; *Plethodon kentucki* (growth curves) 108–117; *Chelydra serpentina* (egg components, egg mass, incub. temp. & genet. effects rel. to htchng. success & htchng. size) 129–135; *Ambystoma talpoideum* (eff. of body size on facultative paedomorphosis, gender diff.) 143–149; *Brevoortia tyrannus*, *Leiostomus xanthurus* (larval devel. of function of swimbladder, spp. diff.) 430–442; *Crotalus enyo* (chg. in prey types from juv. to adult) 553–555; *Bathypterois mediterraneus* (hermaphr. gonad devel., morph. & histol., devel. of eggs, seas.) 556–560; *Natator depressus* (egg dev. & htchng. condit. rel. to egg incub. temp. & hydr.) 668–682; *Bufo americanus* (growth rate manip. & thyroxine admin. used to show loss of plastic. in metamorph. timing late in tdpf. life) 829–834; *Thamnophis validus* (ontogen. diet chng., anurans to fishes) 1034–1042.

DIGESTION, *Bedotia masoala* n. sp. (GI tract anat., stom. conts.) 482–489; *Cephaloscyllium ventriosum* (fasting & postfeeding met. rate) 1108–1113.

DISTRIBUTION, *Dermophis* (7 spp.), *Gymnopis* (2 spp.), *Oscacilia* (3 spp.), *Caecilia* (4 spp.) (maps for all spp.) 52–64; *Chromis (abrupta* n. sp., *fatu-hiva* n. sp., *flavopictis* n. sp.), *Stegastes robertsoni* n. sp. (endemic to Marquesas Isls.) 92–107; *Phoxinus saylori* n. sp. (very limited, biogeogr. hypoth., endngrd. in TN) 118–128; *Harttia longipinnna* n. sp. (n. sp. & all *Harttia* in Brazil) 136–142; *Gerres silaceus* n. sp. (of all *G. setifer* complex spp.) 164–168; *Platymantis browni* n. sp. (endemic to S. New Ireland, PNG) 194–202; *Proceratophrys bigibbosus* sp. group (*brauni* n. sp., *avelinoi*, *bigibbosus*, *palustris*) (n. sp. & revise distrib. of other 3 spp.) 203–215; *Bufo chavin* n. sp. (of sp. group) 216–223; *Cyprinodon diabolis* (smallest range of any fish) 224–228; New World Belonidae (13 spp.) 324–338; *Rana (onca, yavapaiensis)* 339–354; *Nottropis topeka* (stream & watershed charcs. rel. to red. distrib.

of endngrd. sp., mngmnt. implics.) 413–421; *Apgon* (*erythrinus*, *marquesensis* n. sp., *indicus* n. sp., *susanae*) (descript., map) 459–472; *Bedotia masoala* n. sp. (endemic to one Madagascar river basin) 482–489; *Apostolepis breviceps* n. sp. (very limited) 501–507; *Elassoma (boehlkei, okatie)* (ESUs in each river system) 514–520; *Eustomias* (subgenus *Dinematochirus*) 12 n. spp., *similis*, cf. *bigelowi* (of subgenus, maps of some spp.) 683–699; *Cnemidophorus gularis septemvittatus* (new loc. records) 747–765; *Etheostoma (w. whipplei, w. artesiae)* (map, allopatr.) 802–807; *Lepidomeda vittata* (disjunct, declining) 813–819; *Gerres (longirostris, oblongus)* (notes) 954–965; *Aspidoras taurus* n. sp. (n. sp. incr. known distr. of genus) 1010–1016; *Priocharax ariel*, *Serrabrycon magoi*, *Microsternarchus fimbripinnus*, *Acestridium martinii* (extend dist. to Brazil, middle Rio Negro) 1058–1063; *Batrachuperus* (the 5 spp. in China) (of specimen locs. in phyl. anal., mtDNA data) 1100–1107; *Sanzinia madagascariensis*, *Acrantophis madagascariensis*, *Boa constrictor* (close rel. btwn. Madagascar & S. Amer. boids) 1151–1154.

ECOLOGY. *Platymantis browni* n. sp. (notes) 194–202; *Proceratophrys bigibbosa* sp. group (*brauni* n. sp., *avelinoi*, *bigibbosa*, *palustris*) (notes) 203–215; *Bufo chavin* n. sp. (notes) 216–223; *Etheostoma (zonale, olmstedii)*, *Percina peltata* (substrate choice, introd. sp. aff. native congener) 254–261; *Anolis nitens tandai* (microhab. rainfor. leaf litter, activ. cycle, body temp., diet, size sex. dimorph., compared to other subspp.) 401–412; *Notropis topeka* (stream & watershed charcs. rel. to decline of endngrd. sp., mngmnt. implics.) 413–421; *Ascaphus truei* (algae & insect & tdp. herbivores resource-limited) 422–429; *Apostolepis breviceps* n. sp. (notes, fossorial snake) 501–507; *Eleutherodactylus cooki* (reprod. seas. rel. to slight temp. chngs. in caves) 542–547; *Nerodia sipedon*, *Storeria dekayi*, *Thamnophis sirtalis* (popn. subdiv. pttns. & gene flow, spp. diff., rel. to ecol. diff.) 602–614; *Natator depressus* (egg dev. & hatching condit. rel. to egg incub. temp. & hydr.) 668–682; *Cnemidophorus (gularis septemvittatus, g. scalaris)* (notes on ecol. diff., btwn. subspp.) 747–765; *Etheostoma* (5 spp.), *Percina* (3 spp.) (diffs. in larval transport in sympat. spp. correl. w/ life hist. & gene flow diff.) 766–774; *Rana muscosa* (high elev. declining frog, mvmnts. btwn. habs. rel. to environ. variables & yrly. activ. cycle) 787–793; *Etheostoma (rubrum, lycium, whipplei)*, *Noturus hildebrandi*, *Cyprinella carmura* (downstream alterations aff. distant upstream habs., popn. responses) 916–927; *Gasterosteus aculeatus* (trophic diff. in tooth # & pttn.) 936–944; *Rana muscosa* (high oral chytrid fungal infect. rates in tdp., ecol. corrs., rel. to declining popns.) 945–953; *Batrachuperus* (the 5 spp. in China) (mtDNA derived lineages rel. to ecol. & hab. distrib.) 1100–1107.

EGGS. *Gambusia geiseri* (evid. of matrotrophy) 1–6; *Chelydra serpentina* (egg components, egg mass, incub. temp. & genet. effects rel. to hatching success & hatching size) 129–135; *Bufo chavin* n. sp.

(descript. clutch size) 216–223; *Varanus* (incub. time, clutch size, egg mass & neonate size rel. to matern. size & phylogeny) 443–458; *Eleutherodactylus cooki* (clutch size, seas., high mortal. due to cannib. despite male parental care, cave frogs) 542–547; *Bathypterois mediterraneus* (hermaphr. gonad devel. dev. of eggs) 556–560; *Natator depressus* (egg dev. & hatching condit. rel. to egg incub. temp. & hydr.) 668–682; *Etheostoma* (5 spp.), *Percina* (3 spp.) (diffs. in larval transport in sympat. spp. rel. to egg size diff.) 766–774; *Rana muscosa* (hab. & seas. of egg masses) 787–793; *Caretta caretta* (nest factors rel. to dipteran larval infest. of eggs) 808–812; *Chelydra serpentina* (egg size & incub. temp. not aff. juv. righting response duration) 1050–1057; *Python curtus* (vitellogen. & normal ovipos. only w/ male present) 1138–1141.

ENDANGERED SPECIES. *Phoxinus saylori* n. sp. (endngrd. in TN, life hist. info.) 118–128; *Cyprinodon diabolis* (tiny popn. size strongly aff. by hab. water level) 224–228; *Rana (onca, yavapaiensis)* (phyl. anal. shows *R. onca* valid, conserv. reccoms.) 339–354; *Gila cypha* (shape anal. w/ geom. morphomet. aids sp. ident. for conserv. mngmnt.) 389–400; *Notropis topeka* (stream & watershed charcs. rel. to decline of endngrd. sp., mngmnt. implics.) 413–421; *Crotalus (willardi obscurus, w. willardi)* (reprod. info. on threatened subspp.) 473–481; *Elassoma (boehlkei, okatie)* (ESUs in each river system) 514–520; *Moxostoma robustum* (ESU in each river system, mtDNA data) 526–530; *Caretta caretta* (histol. of retina rel. to function, ecol. benefits) 718–725; *Rana muscosa* (pettit. to list as endngrd., yrly. activ. cycle, mvmnts. btwn. habs.) 787–793; *Kinosternon baurii* (endngrd. isol. popn. not diff. mtDNA from other popns.) 797–801; *Lepidomeda vittata* (popn. genet., mtDNA & allozyme data, 3 disjunct popns., low gen. var.) 813–819; *Etheostoma rubrum* (Fed. Threatened, endngrd. in MS, downstream alterations aff. distant upstream habs., popn. responses) 916–927.

EVOLUTION. Teleost fishes (devel. of replcmnt. teeth, charc. distrib., evol. of derived state) 35–51; *Dermophis* (7 spp.), *Gymnopis* (2 spp.), *Oscacilia* (3 spp.), *Caecilia* (4 spp.) (revise Central Amer. caecilians, evol. notes) 52–64; *Podarcis hispanica* (specializ. of tail muscles for min. damage at autotomy) 154–163; New World Belonidae (13 spp.) (phyl. anal., mtDNA & nuclear DNA data, info. on evol. of marine to freshwater hab. shifts) 324–338; snakes & lizards (intramandib. septum anal. supports snake-anguimorph lizard affin.) 531–535; *Dasyatis* (14 of 35 spp.), *Himantura (gerrardi, schmardae)* (clad. anal. of body shape, lat. line charcs. show evol. pttns.) 615–627; *Otopharynx pachycheilus* n. sp. (independ. evol. of thick lips, probable gustatory funct.) 705–717; *Atheris (subocularis, squamigera)* (evol. hypoth. for *A. subocularis* sep. from sister sp., *A. squamigera*) 737–744; *Novumbra hubbsi* (karyotype evol. links *N. hubbsi* w/ *Dalla*) 860–865; *Bufo marinus* (evid. for sex. select. in male forelimb robustness) 928–935.

- FECUNDITY, *Crotalus viridis concolor* (litter size & freq.) 229–234; *Varanus* (incub. time, clutch size, egg mass & neonate size rel. to matern. size & phylogeny) 443–458; *Niveoscincus ocellatus* (geogr. var. in hab. temp. aff. age & size at matur., fecund. conseqs.) 646–655; *Torpedo californica* (age & size at matur., longev., fecund.) 842–847.
- FEEDING, Osteoglossomorpha (*Hiodon*, *Chitala*, *Osteoglossum*) (descript. of morph. var. in charc. complex for biting, import. in using the complex in phyl. anal.) 372–381; *Anolis carolinensis* (taste in food pref.) 490–498; *Sceloporus jarrovii* (testost. implants incr. soc. beh. but not reduce feeding beh. in non-breeding seas.) 966–971; *Cephaloscyllium ventriosum* (fasting & postfeeding met. rate) 1108–1113; *Barbus gananensis* (mouth parts polymorph., 2 morphs same sp., 3rd morph. is undescr. sp. mtDNA data) 1123–1129.
- FOOD, *Phoxinus saylori* n. sp. (notes) 118–128; *Anolis nitens tandai* (stom. conts., prey size rel. to lizard body size) 401–412; *Bedotia masoala* n. sp. (stom. conts., GI tract anat.) 482–489; *Crotalus enyo* (stom. & gut conts.) 553–555; *Rana sylvatica* (eff. of nutrit. level on leech-infected tdpL surv.) 907–915; *Thamnophis validus* (ontogen. diet chng., anurans to fishes) 1034–1042.
- GENETICS, *Rana sphenoecephala* (gen. var. in response to environ. stressor) 7–13; *Eurycea bislineata* spp. complex (*wilderae*, *cirrigera*) (genet. evid. for valid. of spp. at contact zone) 25–34; parthenogenetic *Cnemidophorus laredoensis* = *C. gularis* × *C. sexlineatus* (gen. verif. of separate hybrid origins of clonal complexes A & B) 262–266; *Xiphophorus pygmaeus* (gene basis for male size polymorph. diff. than in other *Xiphophorus* spp.) 355–364; *Clarias* (4 of the 32 spp.), *Heterobranchus* (all 4 spp.), *Channallabes apus* (evid. for monophyly of *H.* & paraphyly of *Clarias*) 548–552; *Nerodia sipedon*, *Storeria dekayi*, *Thamnophis sirtalis* (eff. of gen. drift on popn. subdiv. ptns., spp. diff. rel. to ecol. diff., allozyme data) 602–614; *Trachemys scripta elegans* (mtDNA gene responses to anoxia) 628–637; *Natator depressus* (gen. effs. on egg dev. & hatching condit. rel. to egg incub. temp. & hydr.) 668–682; *Lepidomeda vittata* (popn. genet., mtDNA & allozyme data, 3 disjunct popns., low gen. var.) 813–819; *Cycleptus elongatus*, *meridionalis*, sp. (3 allotop. ESUs, 42 electrophor. loci, diff. in alleles, heterozyg. & dupl. gene expression) 899–906; *Chelydra serpentina* (gen. basis for juv. righting response) 1050–1057; *Salvelinus confluentus*, *fontinalis*, *confluentus* × *fontinalis*, *malma* (interspersed nuclear DNA w/ PCR primers ident. spp. & their hybrids, verify w/ allozymes) 1093–1099.
- GEOGRAPHIC LOCALITIES
- Adriatic Sea, *Chromogobius zebra* 1073–1080.
- Alabama, *Rana capito* 382–388; *Notropis (ammophilus, longirostris)* 638–645; *Notropis (atherinoides, candicus, stilbius)* 656–667; *Etheostoma whipplei artesiae* 802–807; *Cyclopterus meridionalis* 899–906.
- Alaska, *Lamna ditropis* 794–796; *Gasterosteus aculeatus* 936–944.
- Andaman Sea, *Gerres oblongus* 954–965; *Gerres erythrourus* 1043–1049.
- Argentina, *Proceratophrys bigibbosa* sp. group (*brauni* n. sp., *avelinoi*, *bigibbosa*, *palustris*) 203–215.
- Arizona, *Phrynosoma cornutum* 309–323, 1114–1122; *Rana (onca, yavapaiensis)* 339–354; *Gila cypha* 389–400; *Crotalus (willardi obscurus, w. willardi)* 473–481; *Thamnophis (e. vagrans, e. arizonae)* 508–513; *Lepidomeda vittata* 813–819; *Sceloporus jarrovii* 966–971; *Phrynosoma (meallii, platyrhinos, hernandezi)* 1114–1122.
- Arkansas, *Notropis sabinae* 638–645; *Etheostoma* (5 spp.), *Percina* (3 spp.) 766–774; *Etheostoma (w. whipplei, w. artesiae)* 802–807.
- Atlantic Ocean, *Eustomias cryptobulbus* n. sp. (SE) 683–699; *Amblycirrhitus indicus* = *A. pinos* 870–871; *Lycodes (paamiuti n. sp., pallidus)* (N) 972–996; *Chromogobius (britoi n. sp., zebratus)* (E) 1073–1080.
- Australia, *Niveoscincus ocellatus* (Tas.) 646–655; *Natator depressus* (QLD) 668–682; *Gerres longirostris* (QLD) 954–965.
- Bahamas, *Negaprion brevirostris* 781–786.
- Barents Sea, *Lycodes pallidus* 972–996.
- Belize, *Gymnophis syntrema* 52–64.
- Bering Sea, *Lycodes concolor* 972–996.
- Bismarck Archipelago, *Platymantis browni* n. sp. (New Ireland) 194–202.
- Black Sea, *Chromogobius quadrivertittatus* 1073–1080.
- Bolivia, *Potamorhaphis eigenmanni* 324–338; *Apostolepis breviceps* n. sp. 501–507.
- Brazil, *Harttia longipinna* n. sp. 136–142; *Proceratophrys (avelinoi, bigibbosa)* 203–215; *Curimata vari* = *Cyphocharax sanctacatarinae* 267–269; *Belonion apodion*, *Pseudotylosurus angusticeps* 324–338; *Anolis nitens tandai* 401–412; *Jenynsia weitzmani* n. sp. (subgenus *Plesiojenysia*) 726–736; *Serrasalmus rhombeus* 866–869; *Aspidoras taurus* n. sp. 1010–1016; *Moenkhausia (diktyota* n. sp., *oligolepis*, *sanctaefilomenae*, *pyrophthalma*), *Priocnemis ariel*, *Serrabrycon magoi*, *Microsternarchus fimbriipinnus*, *Acetridium martini* 1058–1063.
- California, *Microtremus minimus* 14–24; *Phrynosoma platyrhinos* 309–323, 1114–1122; *Thamnophis (e. elegans, e. terrestris)* 508–513; *Rana muscosa* 787–793, 945–953; *Clinocottus analis*, *Girella nigricans* 835–841; *Torpedo californica* 842–847; *Hyla regilla* 1130–1137.
- Cameroon, *Atheris (subocularis, squamigera)* 737–744.
- Canada, *Thamnophis sirtalis parietalis* (Man.) 82–91; *Thamnophis sirtalis* (Brit. Col.) 365–371; *Ascaphus truei* (Brit. Col.) 422–429; *Thamnophis elegans vagrans* (Brit. Col.) 508–513; *Nerodia sipedon*, *Storeria dekayi*, *Thamnophis sirtalis* (Ont.) 602–614; *Gasterosteus aculeatus* (Brit. Col., Quebec) 936–944; *Lycodes paamiuti* n. sp. (Baffin Bay) 972–996.
- Canary Islands, *Chromogobius britoi* n. sp. 1073–1080.
- Caribbean Sea, *Eptatretus wayuu* n. sp., *Quadratus ancon* n. sp. 1026–1033.
- China, *Gekko gecko* 248–253; *Paramesotriton (guangxiensis, hongkongensis)*, *Pachytriton labiatus*, *Cynops cyanurus* 997–1009; *Batrachuperus* (the 5 spp. in China) 1100–1107.
- Colombia, *Dermophis glandulosus*, *Caecilia (leuco-*

- phala, nigricans), Oscaecilia ochrocephala 52–64; Tomicodon reitzi n. sp. 745–746; Eptatretus wayuu n. sp., Quadratus ancon n. sp. 1026–1033.*
- Colorado, Phrynosoma hernandesi 309–323; Gila (cypha, robusta) 389–400.*
- Congo, Channallabes apus 548–552.*
- Costa Rica, Dermophis (parviceps, costaricense, occidentalis, glandulosus, gracilior), Gymnopis multiplicata, Oscaecilia osae 52–64.*
- Cote d'Ivoire, Heterobranchus (longifilis, isopterus), Clarias (anguillaris, buettikoferi, eibliensis) 548–552.*
- Croatia, Podarcis (melisellensis, muralis) 178–186.*
- Cyprus, Caretta caretta 808–812.*
- Davis Strait, Lycodes paamiuti n. sp. 972–996.*
- Denmark Strait, Lycodes (paamiuti n. sp., pallidus) 972–996.*
- Ecuador, Caecilia nigricans 52–64; Atelopus mendoensis 276–278; Pseudoylosurus angusticeps, Strongylura fluviatilis 324–338.*
- El Salvador, Dermophis mexicanus 52–64.*
- Ethiopia, Lebias stiassnyae n. sp. 150–153; Barbus gananensis (includes an undescribed sp.) 1123–1129.*
- Florida, Belonion argalus argalus, Strangylura timucu 324–338; Rana capito 382–388; Kinosternon baurii 797–801; Lucania goodei 823–828; Bufo marinus 928–935.*
- Georgia, Eurycea wilderae 25–34; Rana capito 382–388; Moxostoma robustum 526–530.*
- Ghana, Strongylura senegalensis 324–338.*
- Greenland Sea, Lycodes (paamiuti n. sp., squamiventer) 972–996.*
- Guatemala, Dermophis mexicanus, Gymnopis (multiplicata, syntrema) 52–64; Strongylura hubbsi 324–338.*
- Hawaii, Apogon erythrinus 459–472; Eustomias (vulgaris n. sp., parini n. sp., magnificus n. sp., longiramis n. sp., elongatus n. sp., bulbiramus n. sp., similis, albubulbus n. sp., problematicus n. sp.) 683–699.*
- Honduras, Dermophis mexicanus, Gymnopis multiplicata 52–64; Typhlops stadelmani 820–822.*
- Idaho, Thamnophis elegans vagrans 508–513.*
- Illinois, Notropis dorsalis 638–645; Cyleptus elongatus 899–906.*
- India, Gerres oblongus 954–965; Gerres phaiya n. sp. 1043–1049.*
- Indian Ocean, Apogon indicus n. sp. 459–472; Eustomias (paxtoni n. sp., cryptobulbus n. sp.) 683–699; Gerres (longirostris, oblongus) 954–965.*
- Indonesia, Gerres (longirostris, oblongus) 954–965; Gerres erythrourus 1043–1049.*
- Iowa, Bufo americanus 829–834.*
- Ivory Coast, Heterobranchus (longifilis, isopterus), Clarias (anguillaris, buettikoferi, eibliensis) 548–552.*
- Japan, Gerres (longirostris, oblongus) 954–965; Gerres erythrourus 1043–1049.*
- Johnson Island, Apogon erythrinus 459–472.*
- Kansas, Rana areolata 382–388; Notropis topeka 413–421; Notropis dorsalis 638–645; Etheostoma w. whipplei 802–807.*
- Kentucky, Plethodon kentucki 108–117; Etheostoma tippecanoe 235–239.*
- Kenya, Gerres longirostris 954–965.*
- Lake Malawi, Otopharynx pachycheilus n. sp. 705–717.*
- Lake Tanganyika, Auchenoglanis occidentalis 566–570.*
- Louisiana, Notropis sabinae 638–645; Etheostoma whipplei artesiae 802–807; Ambystoma (opacum, talpoideum) 1017–1025.*
- Madagascar, Bedotia masoala n. sp. 482–489; Gerres longirostris 954–965; Sanzinia madagascariensis, Acrantophis madagascariensis 1151–1154.*
- Madeira, Chromogobius britoi n. sp. 1073–1080.*
- Malaysia, Gerres silaceus n. sp. 164–168.*
- Maldives, Gerres longirostris 954–965.*
- Marquesas Islands, Chromis (abrupta n. sp., satuhiva n. sp., flavapicis n. sp.), Stegastes robertsoni n. sp. 92–107; Apogon marquesensis n. sp. 459–472; Gerres longirostris 954–965.*
- Maryland, Caretta caretta 240–242; 718–725.*
- Mauritius, Gerres longirostris 954–965.*
- Mediterranean Sea, Bathyphterois mediterraneus (E) 556–560; Caretta caretta 808–812; Chromogobius (zebratus, quadriovittatus) 1073–1080.*
- Mexico, Dermophis (mexicanus [Tab., Chiapas, Oax., Veracruz], oaxacae [Oax., Guer., Jal.]) 52–64; Xiphophorus (10 spp.) (Tam., San Luis Pot., Veracruz, Hid.) 65–81; Anolis nebulosus (Jal.) 187–193; Anolis bourgeaei, Norops (laeviventralis, sericeus) (Veracruz) 274–275; Phrynosoma (asio, orbicularis, coronatum [Baja Cal.], taurus [Puebla], ditmarsi [Son.], mcallii [Son.], solare [Son.]) 309–323; Rana yavapaiensis (Son.) 339–354; Xiphophorus pygmaeus (San Luis Pot.) 355–364; Crotalus willardi obsoletus (Chih., Son.) 473–481; Crotalus enyo (Baja Cal.) 553–555; Cnemidophorus (gularis septemvittatus, g. scalaris) (Chih.) 747–765; Thamnophis validus (Baja Cal., Son., Sin., Nayarit, Jal., Cozumel, Mich., Guer.) 1034–1042.*
- Michigan, Chelydra serpentina 521–525; Notropis (atherinoides, rubellus) 656–667; Rana sylvatica 907–915.*
- Mississippi, Rana sevosa 382–388; Notropis (buccatus, longirostris, rafinesquei, sabinae) 638–645; Etheostoma whipplei artesiae 802–807; Cyleptus (elongatus, meridionalis) 899–906; Etheostoma (rubrum, lynceum, whipplei), Noturus hildebrandi, Cyprinella camura 916–927.*
- Missouri, Rana sphenocephala 7–13; Rana areolata 382–388; Notropis buccatus 638–645; Etheostoma w. whipplei 802–807; Cyleptus elongatus 899–906.*
- Molucca Sea, Eustomias flagellifer n. sp. 683–699.*
- Montana, Salvelinus confluentus × fontinalis 1093–1099.*
- Namibia, Rhoptropus (5 of the 6 spp.) 775–780.*
- Nevada, Cyprinodon diabolis 224–228; Rana onca 339–354; Thamnophis elegans vagrans 508–513; Rana muscosa 945–953.*
- New Caledonia, Gerres longirostris 954–965.*
- New Guinea, Gerres longirostris 954–965.*
- New Mexico, Phrynosoma modestum 309–323, 1114–1122; Notropis jemezanus 656–667; Phrynosoma cornutum 1114–1122.*
- New York, Notropis rubellus 656–667; Gasterosteus aculeatus 936–944.*
- Nicaragua, Dermophis mexicanus, Gymnopis multiplicata 52–64.*
- Niger, Heterobranchus bidorsalis 548–552.*
- North Carolina, Eurycea wilderae 25–34; Rana capito 382–388; Elassoma boehlkei 514–520; Notropis (amoenus, scepticus) 656–667; Anguilla rostrata*

- 848–853; *Cynoscion regalis*, *Ophidion marginatum* 854–859.
- Norwegian Sea, *Lycodes paamiuti* n. sp., *pallidus*, *squamiventer*) 972–996.
- Ohio, *Nerodia sipedon*, *Storeria dekayi*, *Thamnophis sirtalis* 602–614; *Notropis photogenes* 656–667.
- Oklahoma, *Notropis (atherinoides, girardi, perpallidus, suttkusi)* 656–667; *Etheostoma (w. whipplei, w. artesiae)* 802–807.
- Pacific Ocean, *Apogon (indicus* n. sp., *susanae*) 459–472; *Eustomias (vulgaris* n. sp., *parini* n. sp., *paxtoni* n. sp. [W], *magnificus* n. sp. [N], *longiramis* n. sp. [N], *elongatus* n. sp. [N], *bulbifrons* n. sp. [N], *cryptobulbus* n. sp., *similis* [N], *albibulbus* n. sp. [N], *problematicus* n. sp. [N]) 683–699; *Tomicodon reitzi* n. sp. (E) 745–746; *Lamna ditropis* (N) 794–796; *Gerres (longirostris, oblongus)* (W) 954–965; *Lycodes albolineatus* (N) 972–996; *Gerres erythrourus* (W) 1043–1049.
- Palau Islands, *Gerres longirostris* 954–965.
- Panama, *Dermophis (parviceps, glandulosus, gracilior)*, *Caecilia (isthmica, leucocephala, volvoni, nigricans)*, *Oscaecilia (ochrocephala, elongata)*, *Gymnopis multiplicata* 52–64; *Strongylura (exilis, scapularis)* 324–338; *Caecilia volvoni* 561–562; *Bolitoglossa anthracina* n. sp. 700–704.
- Papua New Guinea, *Platymantis browni* n. sp. (Bismarck Arch., New Ireland) 194–202.
- Pennsylvania, *Chelydra serpentina* 129–135; *Etheostoma tippecanoe* 235–239; *Etheostoma (zonale, olmstedi)*, *Percina peltata* 254–261; *Chelydra serpentina* 1050–1057.
- Peru, *Bufo chavin* n. sp. 216–223.
- Philippine Islands, *Lepidichthys springeri* n. sp. 499–500; *Gerres erythrourus* 1043–1049; *Poecilopsetta dorsalis* n. sp. 1081–1086; *Polydactylus longipes* n. sp. 1087–1092.
- Poland, *Gasterosteus aculeatus* 936–944.
- Portugal, *Pelodytes ibericus* 1142–1150.
- Puerto Rico, *Eleutherodactylus cooki* 542–547.
- Red Sea, *Gerres (longirostris, oblongus)* 954–965.
- Seychelles, *Gerres longirostris* 954–965.
- Solomon Islands, *Gerres erythrourus* 1043–1049.
- South Africa, *Gerres (longirostris, oblongus)* 954–965.
- South Carolina, *Eurycea bislineata* spp. complex (*wilderae, cirrigera*) 25–34; *Ambystoma talpoideum* 143–149; *Elassoma (boehlkei, okatie)* 514–520.
- South China Sea, *Eustomias danae* n. sp. 683–699.
- South Dakota, *Thamnophis elegans vagrans* 508–513.
- Spain, *Alytes obstetricans* 169–177.
- Sri Lanka, *Gerres oblongus* 954–965.
- Tanzania, 'Barbus' *amphigamma* & 'Barbus' *taitensis* = 'Barbus' *paludinosus* 243–247.
- Tennessee, *Phoxinus sayori* n. sp. 118–128; *Etheostoma (tippecanoe, denoncourti)* 235–239; *Notropis (ariommus, photogenes, telescopus)* 656–667.
- Texas, *Gambusia grisei* 1–6; parthenogenetic *Cnemidophorus laredoensis* = *C. gularis* × *C. sexlineatus* 262–266; *Hybognathus placitus* 563–565; *Notropis sabinae* 638–645; *Notropis (amabilis, oxyrhynchus, shumardi)* 656–667; *Cnemidophorus (gularis septemvittatus, g. scalaris)* 747–765; *Etheostoma whipplei artesiae* 802–807; *Cycloleptus cf. elongatus* 899–906.
- Thailand, *Gerres silaceus* n. sp. 164–168; *Gerres oblongus* 954–965; *Gerres erythrourus* 1043–1049.
- Tonga, *Gerres oblongus* 954–965.
- Utah, *Rana oncei* 339–354; *Gila (cypha, robusta)* 389–400; *Thamnophis elegans vagrans* 508–513.
- Venezuela, *Belonion dibrachodon*, *Potamorrhaphis (guianensis, pettersi)* 324–338; *Priocnemis ariel*, *Serrabrycon magoi*, *Microsternarchus fimbripinnus*, *Aestridium martini* 1058–1063; *Physalaemus enesefae* 1064–1072.
- Vietnam, *Paramesotriton deloustali* 997–1009.
- Virginia, *Caretta caretta* 240–242, 718–725; *Strongylura marina* 324–338; *Notropis telescopus* 656–667.
- Washington, *Thamnophis elegans vagrans* 508–513; *Novumbra hubbsi* 860–865; *Salvelinus malma* 1093–1099.
- West Virginia, *Etheostoma tippecanoe* 235–239.
- Wyoming, *Crotalus viridis concolor* 229–234; *Thamnophis elegans vagrans* 508–513.
- Zambia, *Heterobranchus boulengeri*, *Clarias gariepinus* 548–552; *Auchenoglanis occidentalis* 566–570.
- Zanzibar, *Gerres longirostris* 954–965.
- GEOMETRIC MORPHOMETRICS**, *Gila (cypha, robusta)* (compare body shapes in sympat. spp. good visualizations aids spp. ident. for conserv. mngrmnt.) 389–400; *Hybognathus placitus* (used to distinguish sex. shape dimorph.) 563–565.
- GROWTH**, *Micrometrum minimus* (male growth var. rel. to reprod. strategies) 14–24; *Plethodon kentucki* (male & female growth curves) 108–117; *Ambystoma talpoideum* (eff. of growth rate on facultative paedomorphism, gender diff.) 143–149; *Caretta caretta* (oxytetracycline valid. growth rings in wild adult) 240–242; *Niveoscincus ocellatus* (geogr. var. in hab. temp. aff. growth curves) 646–655; *Bufo americanus* (growth rate manip. & thyroxine admin. used to test plastic. in metamorph. timing) 829–834; *Torpedo californica* (growth curves by gender) 842–847; *Rana sylvatica* (eff. of leech infect. on tdp. growth) 907–915.
- HABITAT**, *Thamnophis sirtalis parietalis* (mvmnts. & hab. at spring den dispersal, telemetry) 82–91; *Chromis (abrupta* n. sp., *fatuhivaue* n. sp., *flavapicis* n. sp.), *Stegastes robertsoni* n. sp. (notes) 92–107; *Phoxinus sayori* n. sp. (notes) 118–128; *Lebias stiassnyae* n. sp. (notes) 150–153; *Gerres silaceus* n. sp. (notes) 164–168; *Podarcis (melisellensis, muralis)* (thermoreg. in autumn rel. to microhab. temp.) 178–186; *Platymantis browni* n. sp. (notes) 194–202; *Proceratophrys bigibbosus* sp. group (*brauni* n. sp., *avelinoi*, *bigibbosus*, *palustris*) (notes) 203–215; *Bufo chavin* n. sp. (notes) 216–223; *Cyprinodon diabolis* (tiny popn. size strongly aff. by hab. water level) 224–228; *Etheostoma (zonale, olmstedi)*, *Percina peltata* (introd. sp. causes hab. shift in native congeners) 254–261; New World Belontidae (13 spp.) (phyl. anal. w/ mtDNA & nuclear DNA data, info. on evol. of freshwater hab. shifts) 324–338; *Anolis nitens tandai* (microhab.) 401–412; *Notropis topeka* (stream & watershed charcs. rel. to decline of endngd. sp., mngrmnt. implcs.) 413–421; *Bedotia masala* n. sp. (descript.) 482–489; *Lepidichthys springeri* n. sp. (shallow coral reefs)

499–500; *Eleutherodactylus cooki* (reprod. seas. rel. to slight temp. diff. in cave frogs) 542–547; *Auchenoglanis occidentalis* (requirements for nest-building) 566–570; *Niveoscincus ocellatus* (geogr. var. in hab. temp. aff. age & size at matur.) 646–655; *Notropis* (subgenus *Notropis* [16 spp.], 8 other spp.) (phyl. evid. of independ. deriv. of increased olfact. rel. to hab. turbid.) 656–667; *Bolitoglossa anthracina* n. sp. (trop. premontane rainfor. noctur.) 700–704; *Otopharynx pachycheilus* n. sp. (deepwater) 705–717; *Atheris* (*subocularis*, *squamigera*) (possible hab. diff. btwn. sympat. sister spp.) 737–744; *Cnemidophorus* (*gularis septentrionalis*, g. *scalaris*) (notes on hab. diff. btwn. subspp.) 747–765; *Rana muscosa* (mvmnts. btwn. habs. rel. to environ. variables & rly. activ. cycle) 787–793; *Kinosternon baurii* (endngd. isol. popn. diff. hab. from other popns., not diff. mtDNA) 797–801; *Clinocottus analis*, *Girella nigricans* (diel chngs. in hab. use in tidepools rel. to temper. & pred. avoid.) 835–841; *Etheostoma* (*rubrum*, *lynceum*, *whipplei*), *Noturus hildebrandi*, *Cyprinella camura* (downstream alterations aff. distant upstream habs., popn. responses) 916–927; *Gasterosteus aculeatus* (hab. diff. in # & ptn. of teeth) 936–944; *Gerres longirostris* (notes) 954–965; *Lycodes* (*paumiuti* n. sp., *pallidus*, *squamiventer*) (notes) 972–996; *Eptatretus wayuu* n. sp., *Quadratus ancon* n. sp. (depth) 1026–1033; *Gerres phaiya* n. sp. (notes) 1043–1049; *Chromogobius* (*brito* n. sp., *zebratus*, *quadrivittatus*) (notes) 1073–1080; *Hyla regilla* (after acc. for hab. var., introd. pred. fish reduce frog popns.) 1130–1137.

HERMAPHRODITISM, *Bathypterois mediterraneus* (gonad devel., morph. & histol., dev. of eggs, seas.) 556–560.

HISTOLOGY, *Caretta caretta* (of bone showing growth rings in wild adult) 240–242; *Brevoortia tyrannus*, *Leiostomus xanthurus* (larval devel. of function of swimbladder, spp. diff.) 430–442; *Anolis carolinensis* (hist. of taste buds on tongue) 490–498; *Bathypterois mediterraneus* (hermaphr. gonad devel., dev. of eggs) 556–560; *Caretta caretta* (of retina rel. to function, ecol. benefits) 718–725; *Rana muscosa* (oral chytrid fungal infect. in tdppls., diag. charcs.) 945–953.

HOME RANGE, *Plethodon kentuki* (long-term site fidelity) 108–117.

HYBRIDIZATION, parthenogenetic *Cnemidophorus laredoensis* = *C. gularis* × *C. sexlineatus* (in parthen., sep. hybrid. acts produce sep. clonal complexes) 262–266; *Salvelinus* (*confluentus*, *fontinalis*, *confluentus* × *fontinalis*) (method to ident. spp. & their hybrids) 1093–1099.

LARVAE, *Ambystoma talpoideum* (eff. of body size on facultative paedomorphosis, gender diff.) 143–149; *Atelopus mindenensis* (descript. of tdppl.) 276–278; *Asaphus truei* (competit. btwn. tdppls. & insect herbivores) 422–429; *Brevoortia tyrannus*, *Leiostomus xanthurus* (larval devel. of function of swimbladder, spp. diff.) 430–442; *Etheostoma* (5 spp.), *Percina* (3 spp.) (diffs. in larval transport in sympat. spp. correl. w/ life hist. & gene flow

diffs.) 766–774; *Bufo americanus* (growth rate manip. & thyroxine admin. used to show loss of plastic. in metamorph. timing late in tdppl. life) 829–834; *Rana sylvatica* (eff. of leech ectoparasitic infect. on tdppls.) 907–915; *Rana muscosa* (oral chytrid fungal infect. in tdppls., diag. charcs.) 945–953; *Hyla regilla* (introd. pred. fish reduce frog popns. thru pred. on tdppls.) 1130–1137.

LATERAL LINE, *Dasyatis* (14 of 35 spp.), *Himantura* (*gerrardi*, *schmardae*) (charcs. in phyl. anal.) 615–627; *Lycodes pallidus* spp. complex (*paumiuti* n. sp. & 4 other spp.) (charcs. in phyl. anal.) 972–996; *Aspidoras taurus* n. sp. (unique condit. in genus) 1010–1016; *Moenkhausia dityota* n. sp. (incomplete lat. line) 1058–1063; *Chromogobius* (*brito* n. sp., *zebratus*, *quadrivittatus*) (charcs. in disting. n. sp.) 1073–1080.

LIFE HISTORY, *Micrometres minimus* (male growth var. rel. to reprod. strategies) 14–24; *Plethodon kentuki* (age, growth, site fidelity) 108–117; *Phoxinus saylori* n. sp. (notes) 118–128; *Chelydra serpentina* (egg charcs., maternal effects, & incub. temp. rel. to hatching) 129–135; *Ambystoma talpoideum* (eff. of body size on facultative paedomorphosis, gender diff.) 143–149; *Niveoscincus ocellatus* (geogr. var. in hab. temp. aff. age & size at matur.) 646–655; *Etheostoma* (5 spp.), *Percina* (3 spp.) (diffs. in larval transport in sympat. spp. correl. w/ life hist. & gene flow diff.) 766–774; *Torpedo californica* (longev., growth, popn. age struct., age & size at matur., fecund., mortal.) 842–847.

LIGHT, *Gekko gecko* (aff. calling) 248–253.

LOCOMOTION, *Thamnophis sirtalis parietalis* (loc. perform. at spring den dispersal) 82–91; *Podarcis hispanica* (specializ. of tail muscles for min. damage at autotomy) 154–163; *Podarcis* (*melisellensis*, *muralis*) (thermoreg. in autumn, reduced loc. perform.) 178–186; *Chelydra serpentina* (juv. righting response duration aff. by body temp. & family ident.) 1050–1057.

METHODS, *Micrometres minimus* (male otolith rings show growth var. rel. to breeding activ.) 14–24; *Caretta caretta* (oxytetracycline valid. growth rings in wild adult) 240–242; *Bitis arietans* (videoradiography shows internal head, mouth & jaw mvmnts.) 270–273; *Phrynosoma* (11 spp.) (discuss implica. of diff. consensus techniques when phyl. hypoth. of diff. data sets are incongruent) 309–323; *Thamnophis sirtalis* (abnormal thermoreg. in captive gravid females lowers offspring viabil.) 365–371; *Gila* (*cypria*, *robusta*) (geom. morphomet. advantage over truss anal.: better visualization aids spp. ident. for conserv. mngrmnt.) 389–400; fishes (clad. anal. of fishes based on nuclear introns criticized) 536–541; *Notropis* (subgenus *Notropis* [16 spp.], 8 other spp.) (evid. that morph. charcs. rel. to trophic special. can interfere w/ phyl. anal.) 656–667; *Etheostoma* (5 spp.), *Percina* (3 spp.) (sp. ident. of larvae of closely rel. spp. by SSCPs of mtDNA control region) 766–774; *Negaprion brevirostris* (microsat. DNA devel. for popn. & parentage studies in shark) 781–786;

Salvelinus (confluentus, fontinalis, confluentus × fontinalis, malma) (interspersed nuclear DNA w/ PCR primers ident. spp. & their hybrids, verify w/ allozymes) 1093–1099.

MICROSATELLITE DNA, *Negaprion brevirostris* (in determ. patern. of offsp. in shark) 781–786.

MIGRATION, *Brevoortia tyrannus*, *Leiostomus xanthurus* (vertical migration rel. to larval swimbladder devel. & function, spp. diff.) 430–442; *Chelydra serpentina* (juvs. sensit. to dehyd. during land migr.) 521–525; *Rana muscosa* (btwn. habs. during yrly. activ. seas.) 787–793.

MITOCHONDRIAL DNA, *Etheostoma* (*tippecanoe*, *denoncourti*) (confirm sp. ident. of *E. denoncourti* in Duck R. & Buffalo R.) 235–239; *Phrynosoma* (11 spp.) (in phyl. anal. of genus) 309–323; New World Belonidae (13 spp.) (in phyl. anal., agrees w/ nuclear DNA data) 324–338; *Rana* (*onca*, *yavapaiensis*) (in sp. determ.) 339–354; *Thamnophis* (*e. elegans*, *e. terrestris*, *e. vagrans*, *e. arizonae*) (in phyl. anal.) 508–513; *Elassoma* (*boehlkei*, *okatie*) (w/ nuclear DNA, determ. of ESUs) 514–520; *Moxostoma robustum* (in determ. ESUs) 526–530; *Clarias* (4 of the 32 spp.), *Heterobranchus* (all 4 spp.), *Channallabes apus* (evid. for monophyly of *H.* & paraphyly of *Clarias*) 548–552; Pomacentridae (14 of the 29 genera) (in phyl. anal.) 591–601; *Trachemys scripta elegans* (mtDNA gene responses to anoxia) 628–637; *Notropis* (*dorsalis* spp. group (5 spp.), 5 other spp.), 6 other shiner spp. (5 genera) (in phyl. anal.) 638–645; *Notropis* (subgenus *Notropis* [16 spp.], 8 other spp.) (in phyl. anal.) 656–667; *Atheris* (*subocularis*, *squamigera*) (in phyl. anal.) 737–744; *Etheostoma* (5 spp.), *Percina* (3 spp.) (sp. ident. of larvae of closely rel. spp. by SSCPs of mtDNA control region) 766–774; *Rhoptropus* (5 of the 6 spp.) (in phyl. anal.) 775–780; *Kinosternon baurii* (in phyl. anal. of endgrd. popn.) 797–801; *Lepidomeda vittata* (shows low genet. var., 3 disjunct popns.) 813–819; *Parameotriton* (4 of the 6 spp.), *Pachytriton* (1 of the 2 spp.), *Cynops* (2 of the 7 spp.) (in phyl. anal.) 997–1009; *Batrachuperus* (the 5 spp. in China) (in phyl. anal., shows some spp. polyphyl.) 1100–1107; *Barbus gananensis* (reveals 2 morphotypes in *B. gananensis*, 3rd morph is undescr. sp.) 1123–1129; *Sanzinia madagascariensis*, *Acranophis madagascariensis*, *Boa constrictor* (in phyl. anal. & resurr. of genera) 1151–1154.

MORPHOLOGY, Teleost fishes (devel. of replcmnt. teeth, charec. distrib., evol. of derived state) 35–51; *Podarcis hispanica* (specializ. of tail muscles for min. damage at autotomy) 154–163; Osteoglossomorpha (*Hiodon*, *Chitala*, *Osteoglossum*) (descript. of morph. var. in charec. complex, import. in using the complex in phyl. anal.) 372–381; *Gila* (*cypria*, *robusta*) (geom. morphomet. advantage over truss anal.: better visualization aids spp. ident. for conserv. mngrmnt.) 389–400; *Bathypterois mediterraneus* (hermaphr. gonad struct. devel.) 556–560; *Eustomias* (subgenus *Dinematochirus*, 12 n. sp., *similis*, cf. *bigelowi*) (descript. of barbels of n. spp., compare w/in & btwn. subgen.) 683–699; *Caretta caretta* (histol. of retina rel. to function,

ecol. benefits) 718–725; *Bufo marinus* (male forelimb robustness, evid. for sex. select.) 928–935; *Chromogobius* (*britoi* n. sp., *zebratus*, *quadrivittatus*) (cheek myology import. trait for phyl. anal. of gobies) 1073–1080; *Barbus gananensis* (mtDNA reveals 2 morphotypes in *B. gananensis*, 3rd morph is undescr. sp.) 1123–1129.

NESTING, *Eleutherodactylus cooki* (male parental care of nests in cave frog) 542–547; *Auchenoglanis occidentalis* (nesting & brooding beh., male parental care) 566–570; *Natator depressus* (egg dev. & hatching condit. rel. to egg incub. temp. & hydr.) 668–682; *Caretta caretta* (nest factors rel. to dipteran larval infest. of eggs) 808–812.

NOMENCLATURE, *Proceratopryns* (*avelinoi*, *bigibbosa*) (*P. cristinae* = *P. bigibbosa*, specify type local. of *P. avelinoi*) 203–215; *'Barbus'* *amphigramma* & *'Barbus'* *taitensis* = *'Barbus'* *paludinosus* (2 spp. synon. b/c color varies w/ water clarity) 243–247; *Curimata vari* = *Cyphocharax sanctacatarinae* (*C. vari* synon. w/ *C. sanctacatarinae*, examined type specimens of *C. vari*) 267–269; *Anolis bourgeaei*, *Norops* (*laeviventris*, *sericeus*) (synon. sp., examine types) 274–275; *Caecilia volcani* (clarif. of holotype & its location) 561–562; *Atheris* (*subocularis*, *squamigera*) (resurr. *A. subocularis*) 737–744; *Etheostoma* (*w. whipplei*, *w. artesiae*) (raise subspp. to sp. status) 802–807; *Typhlops stadelmani* (resurr. *T. stadelmani*) 820–822; *Amblycirrhites indicus* = *A. pinos* (synon. sp., original local error) 870–871; *Cerres* (*longirostris*, *oblongus*) (*G. longirostris* synon. w/ 7 other spp., *G. oblongatus* synon. w/ 2 other spp., design. neotype & lectotype, respectively) 954–965; *Sanzinia madagascariensis*, *Acranophis madagascariensis*, *Boa constrictor* (resurr. S. & A., mtDNA data) 1151–1154.

NUCLEAR DNA, New World Belonidae (13 spp.) (in phyl. anal., agrees w/ mtDNA data) 324–338; *Rana* (*onca*, *yavapaiensis*) (in sp. determ.) 339–354; *Elassoma* (*boehlkei*, *okatie*) (w/ mtDNA, determ. of ESUs) 514–520; fishes (clad. anal. of fishes based on nuclear introns criticized) 536–541; *Salvelinus* (*confluentus*, *fontinalis*, *confluentus* × *fontinalis*, *malma*) (interspersed nuclear DNA w/ PCR primers ident. spp. & their hybrids, verify w/ allozymes) 1093–1099.

OLFACTION, *Notropis* (subgenus *Notropis* [16 spp.], 8 other spp.) (phyl. evid. of independ. deriv. of increased olfact. rel. to hab. turbid.) 656–667.

OSTEOLOGY, Teleost fishes (devel. of replcmnt. teeth, rel. to osteol.) 35–51; Osteoglossomorpha (*Hiodon*, *Chitala*, *Osteoglossum*) (descript. of morph. var. in charec. complex, import. in using the complex in phyl. anal.) 372–381; snakes & lizards (intramandib. septum anal. supports snake-anguimorph lizard affin.) 531–535; *Dasyatis* (14 of 35 spp.), *Himantura* (*gerrardi*, *schmidae*) (charecs. in phyl. anal.) 615–627.

PARASITES, *Caretta caretta* (nest factors rel. to dipteran larval infest. of eggs) 808–812; *Anguilla rostrata* (introd. swimbladder nematode, infect. rates, aff.

on hosts) 848–853; *Serrasalmus rhombeus* (evid. for cryptic spp. incl. diff. gill parasites) 866–869; *Rana sylvatica* (eff. of leech ectoparasitic infect. on tdples.) 907–915; *Rana muscosa* (high oral chytrid fungal infect. rates in tdples., ecol. correls., rel. to declining popns.) 945–953.

PARTHENOGENESIS, parthenogenetic *Cnemidophorus laredoensis* = *C. gularis* × *C. sexlineatus* (sep. hybrid origins of clonal complexes A & B) 262–266; *Cnemidophorus* (*gularis septentrionalis*, *g. scalaris*) (gonochr. spp.-complex, Chihuahuan popns. assigned to subspp. by color & scutation) 747–765.

PHEROMONES, *Ambystoma* (*opacum*, *talpoideum*) (juv. response to marked substrates, w/in & btwn. spp.) 1017–1025.

PHYLOGENETIC ANALYSIS, Teleost fishes (clad. anal. of devel. of replcmnt. teeth, charc. distrib.) 35–51; *Xiphophorus* (11 spp.) (clad. anal., allozyme charcs.) 65–81; *Etheostoma* (*tippecanoe*, *denoncourti*) (clad. anal. of all popns. of both spp., mtDNA data, confirm sp. ident. of *E. denoncourti* in Duck R. & Buffalo R.) 235–239; *Phrynosoma* (11 spp.) (clad. anal. of genus, mtDNA & morph. charcs., much incongruence btwn. the 2 data sets) 309–323; New World Belontiidae (13 spp.) (clad. anal., mtDNA, nuclear DNA & morph. charcs., info. on evol. of freshwater hab. shifts) 324–338; *Rana* (*onca*, *yavapaiensis*) (clad. anal. shows *R. onca* valid, mtDNA & nuclear DNA evid., conserv. implies.) 339–354; Osteoglossomorpha (*Hiodon*, *Chitala*, *Osteoglossum*) (descript. of morph. var. in charc. complex, import. in using the complex in phyl. anal.) 372–381; *Rana* (*areolata*, *capito*, *sevosa*) (clad. anal., allozyme evid. for resurr. of *R. sevosa* & separ. of *R. areolata* & *R. capito*) 382–388; *Thamnophis* (*e. elegans*, *e. terrestris*, *e. vagrans*, *e. arizonae*) (phyl. anal. of subspp., mtDNA data, 2 subspp. paraphyl.) 508–513; *Elassoma* (*boehlkei*, *okatie*) (of popns., mtDNA & nuclear DNA data) 514–520; fishes (clad. anal. of fishes based on nuclear introns criticized) 536–541; *Clarias* (4 of the 32 spp.), *Heterobranchus* (all 4 spp.), *Channallabes apus* (clad. anal., mtDNA data, evid. for monophly of *H.* & paraphly of *Clarias*) 548–552; Pomacentridae (14 of the 29 genera) (clad. anal., mtDNA data) 591–601; *Dasyatis* (14 of 35 spp.), *Himantura* (*gerrardi*, *schmardae*) (clad. anal., lat. line, osteol., body & tail shape charcs., genera not monophy) 615–627; *Notropis* (*dorsalis* spp. group (5 spp.), 5 other spp.), 6 other shiner spp. (5 genera) (clad. anal., mtDNA data, sister rels. w/in *N. dorsalis* spp. group, add *N. buccatus* to spp. group) 638–645; *Notropis* (subgenus *Notropis* [16 spp.], 8 other spp.) (clad. anal., mtDNA data, sister rels. in subgenus, removal of 2 spp. from subgenus, *Notropis* not monophy) 656–667; *Atheris* (*subocularis*, *squamigera*) (resurr. *A. subocularis*, redescribe *A. subocularis* & Cameroon popn. of *A. squamigera*, clad. anal. of 9 spp. *Atheris*, mtDNA data) 737–744; *Rhopitropus* (5 of the 6 spp.) (clad. anal., mtDNA data, agrees w/ previous phyl. anal. w/ morph. & allozyme data) 775–780; *Kinosternon baurii*

(clad. anal. of popns. across sp. range, endngrd. isol. popn. not diff. mtDNA) 797–801; *Lycodes pallidus* spp. complex (*paamuti* n. sp. & 4 other spp.) (clad. anal., lat. line & morph. charcs., sister spp.) 972–996; *Paramesotriton* (4 of the 6 spp.), *Pachytriton* (1 of the 2 spp.), *Cynops* (2 of the 7 spp.) (clad. anal., mtDNA data, all genera in one clade, *Cynops* polyphyl., morph. charcs. of 14 spp. to clarify rels.) 997–1009; *Batrachuperus* (the 5 spp. in China) (clad. anal., mtDNA data, some spp. polyphyl.) 1100–1107; *Barbus gananensis* (clad. anal. of 3 morphotypes, mtDNA data, show one morph is undescri. sp.) 1123–1129; *Sanzinia madagascariensis*, *Acantophis madagascariensis*, *Boa constrictor* (clad. anal., mtDNA data, resurr. *S. & A.*, still closer to *Boa* than to pythons) 1151–1154.

PHYSIOLOGY, *Gambusia affinis* (evid. of matrotrophy) 1–6; *Brevoortia tyrannus*, *Leiostomus xanthurus* (source of gas for larval swimbladder devl. & function, spp. diff.) 430–442; *Trachemys scripta elegans* (met. rate red. in anoxia rel. to mtDNA gene expression) 628–637; *Natator depressus* (influence of incub. temp. & hydr. on physiol. of embryos & hatchlings) 668–682; *Lamna ditropis* (body temps. well above ambient) 794–796; *Cephaloscyllium ventriosum* (fasting & postfeeding met. rate, sedentary shark) 1108–1113; *Phrynosoma cornutum* [squirts blood], 5 of 7 spp. not prev. reported to squirt blood) (physiol. cost of blood-squirting) 1114–1122.

POPULATIONS, *Rana sphenocephala* (diffs. in gen. var. in response to environ. stressor) 7–13; *Eurycea bislineata* spp. complex (*wilderi*, *cirrigera*) (genet. evid. for valid. of spp. at contact zone) 25–34; *Xiphophorus* (11 spp.) (29 popns., phyl. anal., allozyme charcs.) 65–81; *Thamnophis sirtalis parietalis* (mating & myrm. effects of unusually dense popn. at spring den dispersals) 82–91; *Cyprinodon diabolis* (tiny popn. size strongly aff. by hab. water level) 224–228; *Crotalus viridis concolor* (3 popns., female reprod. biol., compare to other popns.) 229–234; *Xiphophorus pygmaeus* (some large males in one popn., none in another, gene diff. than lg. male gene in other *Xiphophorus* spp.) 355–364; *Rana* (*areolata*, *capito*, *sevosa*) (phyl. anal. of 20 popns. of *R. capito*, allozyme evid. for resurr. of *R. sevosa* & separ. of *R. areolata* & *R. capito*) 382–388; *Elassoma* (*boehlkei*, *okatie*) (in each river system one ESU) 514–520; *Maxostoma robustum* (ESU in each river system, conserv. implies.) 526–530; *Nerodia sipedon*, *Storeria dekayi*, *Thamnophis sirtalis* (popn. subdiv. ptns. & gene flow, spp. diff. rel. to ecol. diff.) 602–614; *Niveoscincus ocellatus* (popn. var. in hab. temp. aff. age & size at matur.) 646–655; *Kinosternon baurii* (phyl. anal. of popns. across sp. range, endngrd. isol. popn. not diff. mtDNA) 797–801; *Lepidomeda vittata* (popn. genet., mtDNA & allozyme data, 3 disjunct popns., low gen. var.) 813–819; *Torpedo californica* (demographics, age & growth, ann.popn. reprod., mortal.) 842–847; *Etheostoma* (*rubrum*, *lynceum*, *whipplei*), *Noturus hildebrandi*, *Cyprinella camura* (downstream alterations aff. distant upstream hab., popn. responses) 916–927; *Gaster-*

osteus aculeatus (popn. diff. in # & ptn. of teeth rel. to hab. & Atlantic vs. Pacific basin loc.) 936-944.

PREDATION, *Podarcis hispanica* (specializ. of tail muscles for min. damage at autotomy) 154-163; *Anolis nebulosus* (pred. defence aff. perch height) 187-193; *Anolis nitens tandai* (prey size rel. to lizard body size, lizard microhab. provides protect. from pred.) 401-412; *Anolis carolinensis* (taste in prey discrimin.) 490-498; *Eleutherodactylus cooki* (high egg pred. due to cannib. in cave frog) 542-547; *Crotalus enyo* (chng. in prey types with size of snake) 553-555; *Rana muscosa* (mvmnts. btwn. lakes rel. to avail. of prey, *H. regilla* tdples., & lack of preys., introd. trout) 787-793; *Clinocottus analis*, *Girella nigricans* (diel chngs. in hab. use in tidepools rel. to temper. & pred. avoid.) 835-841; *Thamnophis validus* (prey type rel. to snake size) 1034-1042; *Phrynosoma cornutum* [squirts blood], 5 of 7 spp. not prev. reported to squirt blood (var. in blood-squirting defence to dog pred., absent in 3 spp.) 1114-1122; *Hyla regilla* (introd. pred. fish reduce frog popns. thru pred. on tdples.) 1130-1137.

REPRODUCTION, *Gambusia geiseri* (evid. of matrotrophy) 1-6; *Micrometrus minimus* (male growth var. rel. to reprod. strategies) 14-24; *Thamnophis sirtalis parietalis* (mating, ctshp. & mass loss at spring den dispersal) 82-91; *Phoxinus saylori* n. sp. (notes on seas., nest-associates) 118-128; *Chelydra serpentina* (egg charcs., maternal effects & incub. temp. rel. to hatching) 129-135; *Ambystoma talpoideum* (gender diff. in reprod. costs rel. to gender diff. in facultative paedomorphosis) 143-149; *Atyles obstetricans* (female mate choice rel. to call timing in male duets) 169-177; *Anolis nebulosus* (perch height & gender diff. rel. to reprod. seas.) 187-193; *Proceratophrys bigibbosa* sp. group (*brauni* n. sp., *avelinoi*, *bigibbosa*, *palustris*) (notes on seas. & calling) 203-215; *Bufo chavin* n. sp. (notes on seas. & clutch size) 216-223; *Crotalus viridis concolor* (seas. rel. to temp., preg. female mvmnts., litter size, female size, offsp. size & sex ratio, 3 popns.) 229-234; *Gekko gecko* (seas. var. in calls rel. to reprod.) 248-253; *Xiphophorus pygmaeus* (female pref. for lg. males absent, gene basis for male size polymorph. diff. than in other *Xiphophorus* spp.) 355-364; *Thamnophis sirtalis* (abnormal thermoreg. in captive gravid females lowers offspring viability) 365-371; *Varanus* (incub. time, clutch size, egg mass & neonate size rel. to matern. size & phylogeny) 443-458; *Crotalus (willardi obscurus, w. willardi)* (seas., reprod. freq., litter size rel. to matern. size, neonate size) 473-481; *Eleutherodactylus cooki* (seas. rel. to slight temper. chngs. in caves) 542-547; *Bathypterois mediterraneus* (hermaphr. gonad devel., morph. & histol., dev. of eggs, seas.) 556-560; *Auchenoglanis occidentalis* (nesting & brooding beh., male parental care) 566-570; *Niveoscincus ocellatus* (geogr. var. in hab. temp. aff. age & size at matur., reprod. conseqs.) 646-655; *Natalator depressus* (egg dev. & hatching condit. rel. to egg incub. temp.

& hydr.) 668-682; *Jenynsia weitzmani* n. sp. (subgenus *Plesiojenynsia*) (vivip. sp., ovary & embryo morph.) 726-736; *Etheostoma* (5 spp.), *Perina* (3 spp.) (diffs. in larval transport in sympat. spp. correl. w/ life hist. & gene flow diff.) 766-774; *Negaprion brevirostris* (natal homing, biennial reprod. cycle, microsat. DNA evid. of mult. patern. of litter) 781-786; *Rana muscosa* (seas. & hab. of egg masses) 787-793; *Caretta caretta* (nest factors rel. to dipteran larval infest. of eggs) 808-812; *Lucania goodei* (male breeding beh.) 823-828; *Torpedo californica* (age & size at sex, matur., fecund., popn. ann. reprod. rate) 842-847; *Bufo marinus* (forelimb robustness aids breeding males, evid. for sex. select.) 928-935; *Sceloporus jarrovii* (eff. of testost. implants on male feeding & soc. beh. in presence of receptive & non-recept. females) 966-971; *Physalaemus enesefae* (call descript., var.) 1064-1072; *Python curtus* (female reprod. cycle starts but not complete unless male present) 1138-1141.

RESPIRATION, *Trachemys scripta elegans* (mtDNA gene responses to anoxia) 628-637; *Cephaloscyllium ventriosum* (met. rate as O₂ uptake, fasting & post-feeding) 1108-1113.

SALINITY, *Kinosternon baurii* (endngrd. isol. popn. saline hab., diff. from other popns., not diff. mtDNA) 797-801.

SEX, *Thamnophis sirtalis parietalis* (ratios at spring den dispersal) 82-91; *Ambystoma talpoideum* (eff. of gender on facultative paedomorphosis) 143-149; *Crotalus viridis concolor* (sex ratio of offsp.) 229-234; *Atheris (subocularis, squamigera)* (only male specimens of *A. subocularis*, evol. hypoth.) 737-744.

SEXUAL DIMORPHISM, *Thamnophis sirtalis parietalis* (of mvmnts., mating & mass loss at spring den dispersal) 82-91; *Plethodon kentucki* (in growth curves) 108-117; *Anolis nitens tandai* (in mass, limb length, dewlap size & color) 401-412; *Benedicta masoala* n. sp. (strong, greater than congeners) 482-489; *Crotalus enyo* (sex. size dimorph. but no signif. diet diff. btwn. genders) 553-555; *Hybognathus placitus* (body shape dimorph.) 563-565; *Bufo marinus* (male forelimb robustness, evid. for sex. select.) 928-935; *Gasterosteus aculeatus* (large gender diff. in tooth #) 936-944; *Moenkhausia dityota* n. sp. (mature males have hooks on anal fins) 1058-1063.

SIZE, *Plethodon kentucki* (correl. of age & body size, gender diff.) 108-117; *Chelydra serpentina* (maternal size rel. to egg size, & egg size rel. to egg components, hatching success & hatching size) 129-135; *Ambystoma talpoideum* (eff. of body size on facultative paedomorphosis, gender diff.) 143-149; *Crotalus viridis concolor* (dwarf snake, female & offsp. size, litter size rel. to female size) 229-234; *Xiphophorus pygmaeus* (some large males in one popn., none in another, gene diff. than lg. male gene in other *Xiphophorus* spp.) 355-364; *Varanus* (incub. time, clutch size, egg mass & neonate size rel. to matern. size & phylogeny) 443-458; *Crotalus (willardi obscurus, w. willardi)* (neo-

nate size, litter size rel. to matern. size) 473–481; *Crotalus enyo* (chng. in prey types with size of snake) 553–555; *Niveoscincus ocellatus* (geogr. var. in hab. temp. aff. age & size at matur.) 646–655; *Natator depressus* (eff. on hatchling, size of diff. incub. temps. & hydric condts.) 668–682; *Bufo americanus* (growth rate manip. & thyroxine admin. used to test plastic. in metamorph. timing, diff. sizes at metamorph.) 829–834; *Torpedo californica* (age & size at sex. matur., max. size) 842–847; *Rana sylvatica* (eff. of tdp. body size on leech-infected tdp. growth & surv.) 907–915; *Aspidoras taurinus* n. sp. (largest in genus) 1010–1016; *Thamnophis validus* (prey type rel. to snake size) 1034–1042; *Physalaemus enesefae* (call var. rel. to body size) 1064–1072.

SOUND, *Bitis arietans* (mechanics of defensive hissing in snake) 270–273; *Cynoscian regalis*, *Ophidion marginatum* (captive *O. marginatum* "chatters" like field recordings of "chatters" attrib. to *C. regalis*, oscillograms & sonograms) 854–859; *Physalaemus enesefae* (call descript., var., oscillograms, sonograms) 1064–1072.

SURVIVAL, *Plethodon kentucki* (longev.) 108–117; *Rana sylvatica* (eff. of leech infect. on tdp. surv.) 907–915.

SWIMBLADDER, *Brevoortia tyrannus*, *Leiostomus xanthurus* (larval devel. of function of swimbladder, spp. diff.) 430–442; *Anguilla rostrata* (introd. swimbladder parasite) 848–853.

SYSTEMATICS, *Eurycea bislineata* spp. complex (*wilderae*, *cirrigera*) (genet. evid. for valid. of spp. at contact zone) 25–34; Teleost fishes (devel. of replacmnt. teeth, charc. distrib., evol. of derived state) 35–51; *Dermophis* (7 spp.), *Gymnopis* (2 spp.), *Oscacelius* (3 spp.), *Caecilia* (4 spp.) (revise Central Amer. caecilians, evol. notes, key to spp.) 52–64; *Xiphophorus* (11 spp.) (phyl. anal., allozyme charcs.) 65–81; *Chromis* (*abrupta* n. sp., *fatuhiiae* n. sp., *flavapenis* n. sp.), *Siegestes robertsoni* n. sp. (n. spp. endemic to Marquesas Isls.) 92–107; *Phoxinus saylori* n. sp. (n. sp., hypoth. sister sp., limited distrib.) 118–128; *Harttia longipinnna* n. sp. (n. sp., compar. to congeners, key to *Harttia* spp.) 136–142; *Lebias stiassnyae* n. sp. (n. sp. rel. to congeners, clad. notes) 150–153; *Gerres silaceus* n. sp. (n. sp. in *G. setifer* complex, compar. to those spp. & *G. poiei*) 164–168; *Platymantis browni* n. sp. (n. sp. compar. to all Papuan congeners) 194–202; *Proceratophrys bigibbosa* sp. group (*browni* n. sp., *avelinoi*, *bigibbosa*, *palustris*) (n. sp. & redescript. of other spp., key to spp., synon. *P. cristinae* into *P. bigibbosa*) 203–215; *Bufo chavin* n. sp. (n. sp., *B. veraguensis* sp. group) 216–223; *Etheostoma* (*tippicanoe*, *denoncourti*) (phyl. anal. of Duck R. & Buffalo R. E. denoncourti, mtDNA data, confirm sp. ident.) 235–239; 'Barbus' *amphigrama* & 'Barbus' *taitensis* = 'Barbus' *paludinosus* (coloration as diagn. charc. not valid) 243–247; *Curimata vari* = *Cyphocharax santacatarinae* (synon. spp.) 267–269; *Anolis bourgeai*, *Norops* (*taevivensis*, *sericeus*) (synon. sp., examine types) 274–275; *Atelopus mindoensis* (descript. of tdp., group tdp., phylogenetically) 276–278; *Phrynosoma* (11 spp.)

(phyl. anal. of genus, mtDNA & morph. charcs., much incongruence btwn. the 2 data sets) 309–323; New World Belonidae (13 spp.) (phyl. anal., mtDNA, nuclear DNA & morph. charcs., info. on evol. of freshwater hab. shifts) 324–338; *Rana* (*onca*, *yavapaiensis*) (phyl. anal. shows *R. onca* valid, mtDNA & nuclear DNA evid., conserv. impl. ics.) 339–354; Osteoglossomorpha (*Hiodon*, *Chitala*, *Osteoglossum*) (descript. of morph. var. in charc. complex, import. in using the complex in phyl. anal.) 372–381; *Rana* (*areolata*, *capito*, *sevosa*) (phyl. anal., allozyme evid. for resurr. of *R. sevosa* & separ. of *R. areolata* & *R. capito*) 382–388; *Gila* (*cypha*, *robusta*) (geom. morphomet. shape anal. separ. sympat. spp. in most localities) 389–400; *Apogon* (*erythrinus*, *marquesensis* n. sp., *indicus* n. sp., *susaneae*) (revise spp. complex, key to spp.) 459–472; *Bedotia masoala* n. sp. (n. sp. compared to Madagascar congeners) 482–489; *Lepadichthys springeri* n. sp. (n. sp., key to all 10 spp. of genus) 499–500; *Apostolepis* (*breviceps* n. sp., *vittata*) (n. sp., phyl. notes, closest rels.) 501–507; *Thamnophis* (*e. elegans*, *e. terrestris*, *e. vagrans*, *e. arizonae*) (phyl. anal. of subspp., mtDNA data, 2 subspp. paraphyl.) 508–513; snakes & lizards (intramandib. septum anal. supports snake-anguimorph lizard affin.) 531–535; fishes (clad. anal. of fishes based on nuclear introns criticized) 536–541; *Clarias* (4 of the 32 spp.), *Heterobranchus* (all 4 spp.), *Channallabes apus* (phyl. anal., mtDNA data, evid. for monophony of *H.* & paraphyly of *Clarias*) 548–552; Pomacentridae (14 of the 29 genera) (phyl. anal., mtDNA data, supports monophony of Amphiprioninae, not of 2 other subfams.) 591–601; *Dasyatis* (14 of 35 spp.), *Himantura* (*gerrardi*, *schmardae*) (phyl. anal., lat. line, osteol., body & tail shape charcs., genera not monophy.) 615–627; *Notropis* (*dorsalis* spp. group (5 spp.), 5 other spp.), 6 other shiner spp. (5 genera) (phyl. anal., mtDNA data, sister rels. w/ in *N. dorsalis* spp. group, add *N. buccatus* to spp.-group) 638–645; *Notropis* (subgenus *Notropis* [16 spp.], 8 other spp.) (phyl. anal., mtDNA data, sister rels. in subgenus, removal of 2 spp. from subgenus, *Notropis* not monophy.) 656–667; *Eustomias* (subgenus *Dinematochirus*, 12 n. sp., *similis*, cf. *bigelowi*) (n. spp., new specimens & redescribe *E. similis*, describe *E. cf. bigelowi*, key to subgen.) 683–699; *Bolitoglossa anthracina* n. sp. (n. sp. compare to sympat. & other Cent. Amer. congeners) 700–704; *Otopharynx pachycheilus* n. sp. (n. sp. compared to congeners & related thick-lipped sp.) 705–717; *Jenysis weitzmani* n. sp. (subgenus *Plesiojenysis*) (n. sp., phyl. anal. of genus, osteol. charcs., sister rels., key to spp. of genus) 726–736; *Atheris* (*subocularis*, *squamigera*) (resurr. *A. subocularis*, redescribe *A. subocularis* & Cameroon popn. of *A. squamigera*, phyl. anal. of 9 spp. *Atheris*, mtDNA data) 737–744; *Tomicodon reitti* n. sp. (n. sp. compare to congeners) 745–746; *Cnemidophorus* (*gularis septentrionalis*, *g. scalaris*) (Chihuahuan popns. assigned to subspp. by color. & scutation) 747–765; *Rhoptropus* (5 of the 6 spp.) (phyl. anal., mtDNA data, agrees w/ previous phyl. anal. w/

morph. & allozyme data) 775-780; *Etheostoma* (*w. whipplei*, *w. artesiae*) (raise subspp. to sp. status, rediagnosis, non-overlapping scale counts) 802-807; *Typhlops stadelmani* (resurr. & rediagn. *T. stadelmani*, compare to *T. tenuis*) 820-822; *Novumbra hubbsi* (karyotype links *N. hubbsi* w/ *Dallia*) 860-865; *Serrasalmus rhombeus* (2 karyotypes evid. for cryptic spp., some morph. & parasite diff. btwn. forms) 866-869; *Cycleptus* (*elongatus*, *meridionalis*, sp.) (3 allotrop. ESUs, electrophor. data, Rio Grande popn. is 3rd sp.) 899-906; *Gerris* (*longirostris*, *oblongus*) (*G. longirostris* synon. w/ 7 other spp., *G. oblongatus* synon. w/ 2 other spp., design. neotype & lectotype, respectively, rediagnose, compare to each other & to synon. spp. & problematic specimens) 954-965; *Lycodes pallidus* spp. complex (*paamiuti* n. sp. & 4 other spp.) (n. sp., redescribe other spp., phyl. anal., lat. line & morph. charcs.) 972-996; *Paramesotriton* (4 of the 6 spp.), *Pachytriton* (1 of the 2 spp.), *Cynops* (2 of the 7 spp.) (phyl. anal., mtDNA data, all genera in one clade, *Cynops* polyphyl., morph. charcs. of 14 spp. to clarify rels.) 997-1009; *Aspidoras taurus* n. sp. (n. sp., phyl. notes, largest sp. in genus) 1010-1016; *Eptatretus wayuu* n. sp., *Quadratus ancon* n. sp. (n. spp. compare to rels.) 1026-1033; *Geres erythrourus* spp. complex (*phaiyi* n. sp., *erythrourus*) (n. sp., rediag. *G. erythrourus*, describe spp. complex, discuss confusion w/ *G. poeti* & *G. poeti*) 1043-1049; *Moenkhausia* (*diktyota* n. sp., *oligolepis*, *sanctaefilomenae*, *pyrophthalma*) (n. sp. compare to similar congeners) 1058-1063; *Chromogobius* (*brito* n. sp., *zebratus*, *quadrivittatus*) (n. sp. compare to congeners, key to spp., discuss cheek myology as trait in phyl. anal. of gobies) 1073-1080; *Poecilopsetta dorsalis* n. sp. (n. sp. compare to the 6 other Pacific O. congeners) 1081-1086; *Polydactylus longipes* n. sp. (n. sp. compare to 4 closely rel. congeners) 1087-1092; *Batrachuperus* (the 5 spp. in China) (phyl. anal., mtDNA data, some spp. polyphyl.) 1100-1107; *Barbus gananensis* (phyl. anal. of 3 morphotypes, mtDNA data, show one morph is undescr. sp.) 1123-1129; *Sanzinia madagascariensis*, *Acrantophis madagascarien-*

sis, *Boa constrictor* (phyl. anal., mtDNA data, resurr. S. & A., still closer to *Boa* than to pythons) 1151-1154.

TASTE, *Anolis carolinensis* (taste discrim. not due to vomeronasal organ stim.) 490-498; *Otopharynx pachycheilus* n. sp. (hypertrophied lips have numerous probable taste buds) 705-717.

TEMPERATURE, *Chelydra serpentina* (incub. temp. rel. to hatching success & hatching deform.) 129-135; *Podarcis (melisellensis, muralis)* (thermoreg. in autumn) 178-186; *Anolis nebulosus* (aff. perch height) 187-193; *Crotalus viridis concolor* (rel. to reprod. seas.) 229-234; *Gekko gekko* (aff. calling) 248-253; *Thamnophis sirtalis* (abnormal thermoreg. in captive gravid females lowers offspring viability) 365-371; *Anolis nitens tandai* (body temp., thermoreg.) 401-412; *Eleutherodactylus cooki* (reprod. seas. rel. to slight temp. chngs. in caves) 542-547; *Niveoscincus ocellatus* (geogr. var. in hab. temp. aff. age & size at matur.) 646-655; *Natator depressus* (egg dev. & hatching condit. rel. to egg incub. temp. & hydr.) 668-682; *Lamna ditropis* (body temps. well above ambient) 794-796; *Clinocottus analis*, *Girella nigricans* (diel chngs. in hab. use in tidepools rel. to temper. & pred. avoid.) 835-841; *Rana sylvatica* (eff. of temp. on leech-infected tadpl. growth & surv.) 907-915; *Chelydra serpentina* (juv. righting response duration aff. by body temp.) 1050-1057.

TOXICITY, *Rana sphenocephala* (gen. var. in response to insecticide toxic.) 7-13.

TRUSS ANALYSIS, *Gila (cypha, robusta)* (geom. morphomet. advantage over truss anal.: better visualization aids spp. ident. for conserv. mgmnt.) 389-400; *Hybognathus placitus* (used to distinguish sex. shape dimorph.) 563-565.

VISION, *Caretta caretta* (histol. of retina rel. to function, ecol. benefits) 718-725.

WATER BALANCE, *Chelydra serpentina* (juvs. sensit. to dehydr. during land migr.) 521-525; *Natator depressus* (egg dev. & hatching condit. rel. to egg incub. temp. & hydr.) 668-682.